

S.Y.B.SC. SEM – III (2014 Course) : WINTER - 2018
SUBJECT : CHEMISTRY : PHYSICAL & ANALYTICAL CHEMISTRY (C – 31)

Day : Tuesday
Date : 16/10/2018

W-2018-0803

Time : 12.00 NOON TO 02.00 PM
Max. Marks : 40

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Use of scientific calculator / Log table is **ALLOWED**.
 - 4) Draw neat and labeled diagrams **WHEREVER** necessary.
 - 5) Answers to both the sections should be written in the **SAME** answer book.
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SECTION – I [Physical Chemistry]

- Q.1** Attempt **ANY TWO** of the following: **[10]**
- a) What is meant by a process? Discuss in detail
 - b) Explain the use of alternating current with respect to measurement of conductance.
 - c) Entropy is a measure of order and disorder. Explain.
- Q.2** Attempt **ANY ONE** of the following: **[05]**
- a) Discuss the theory and principle of conductometric titration.
 - b) Obtain the expression for entropy change in mixing of gases.
- Q.3** Solve **ANY TWO** of the following: **[05]**
- a) Specific resistance of centinormal solution of KCl is 817 Ohm. cm. Find its equivalent conductance.
 - b) A steam engine operates between 421K and 321K. What is the minimum amount of heat absorbed from hot reservoir to obtain 100J work?
 - c) Calculate the change in molar entropy when 1 mol of CO₂ expands isothermally from 1.5 litre to 4.5 litre. (R = 8.214 KJ⁻¹ mol⁻¹).

SECTION – II [Analytical Chemistry]

- Q.4** Attempt **ANY TWO** of the following: **[10]**
- a) Describe Duma's method for estimation of nitrogen.
 - b) Explain steam distillation method.
 - c) Derive Ostwald's dilution law.
- Q.5** Attempt **ANY ONE** of the following: **[05]**
- a) Distinguish clearly between precision and accuracy.
 - b) Explain : i) Sample ii) Gross sample.
- Q.6** Attempt **ANY TWO** of the following: **[05]**
- a) How many significant figures does each of the following numbers have?
i) 0.5000 ii) 2.5080 iii) 1.3478 iv) 8.0008 v) 3.4050
 - b) Calculate deviation and mean deviation of the following replicate set of data:
i) 15.17 ii) 15.15 iii) 15.18
 - c) The result of analysis was found to give 89.00% of metal compound compare to the true value of 78.89%. What is the relative error in percentage?

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